

REMARKS

Claims 1-15 are pending in this application. By this Amendment, claims 1, 4 and 11 are amended to even further distinguish over the applied references and claims 13-15 are added. No new matter is added.

I. Information Disclosure Statement

The Office Action indicates that the Examiner did not consider reference DE 69701432, submitted with the August 2, 2007 Information Disclosure Statement (IDS). While the Office Action indicates that the Examiner will consider the reference if a full translation is provided, under the U.S. Patent Office's guidelines, a full translation of a foreign language reference is not required when submitting a foreign language reference provided that Applicant submits a concise explanation of the relevance (37 C.F.R. 1.98(3)(i)).

Applicants adopt the English language translation of the Abstract of reference DE 69701432 submitted with the August 2, 2007 IDS as the concise explanation of relevance of DE 69701432. Applicants do not have a translation of the German reference. Thus, Applicants request that the Examiner consider DE 69701432 and provide Applicants with a copy of the August 2, 2007 PTO-1449 form with reference DE 69701432 initialed as considered.

II. The Claims Are Patentable Over The Applied References

The Office Action (1) rejects claims 1-10¹ under 35 U.S.C. §102(b), or in the alternative, under 35 U.S.C. §103(a), over U.S. Patent Application Publication No. 2001/0053469 to Kobayashi et al. (Kobayashi); and (2) rejects claims 11-12 under 35 U.S.C. §103(a) over Kobayashi in view of U.S. Patent Application Publication No. 2003/0029179 to Vander Woude et al. (Vander Woude). Applicants respectfully traverse the rejections.

¹ The Office Action lists claims 1-9 in the header of the rejection, but includes claim 10 in the body of the rejection.

Regarding independent claims 1, 4 and 11, Kobayashi fails to disclose (1) "a temperature-maintenance operation controller that ... while said fuel cell system is not operating, executes temperature-maintenance operation of said fuel cell using heat generated through electrochemical reaction" (claims 1 and 4) and "[a]n operation method for a fuel cell system that ... executes temperature-maintenance operation of the fuel cell using heat generated through electrochemical reaction if the detected fuel cell operating temperature equals or falls below a first reference temperature" (claim 11); and (2) an abnormality detection unit (or step of determining whether an abnormality has occurred) "that determines whether a detected abnormality regarding said fuel cell operating temperature has occurred in said temperature detector" (claims 1, 4 and 11).

Kobayashi discloses an apparatus GS1 for warming up a fuel cell 1 as an initial part of operating the fuel cell 1 (Fig. 1; paragraph [0051]). The apparatus GS1 comprises thermo-sensors T_1 , T_s , T_3 , airometer (flow sensor) Q, and humidity sensor H (paragraph [0055]). The thermo-sensor T_1 detects the temperature of the supply gas A at the inlet of fuel cell 1 of the cathode pole side (Fig. 1; paragraph [0064]) and thermo-sensor T_3 detects the temperature of the exhaust air Ae at the outlet of the fuel cell 1 at the cathode pole side (Fig. 1; paragraph [0066]). A controller 4 receives signals from the sensors T_1 , T_2 , T_3 , Q, and H and controls the flow amount, temperature, and humidity of supply air A supplied to the inlet of fuel cell 1 at the cathode pole side (paragraph [0073]). The operation of apparatus GS1 is shown in the flow chart of Fig. 4. In operation, if the temperature sensed by thermo-sensor T_3 , is greater than or equal to 20°C, then the apparatus GS1 switches to normal mode (steps S4 and S5). However, if the temperature sensed by thermo-sensor T_3 is less than 20° C (step S4) and the temperature sensed by thermo-sensor T_1 is greater than or equal to 75° C (steps S6 and S13) and thereafter increases (Fig. 4, step S16), an alarm lamp is lit (step S19). Thus, Kobayashi

discloses that the alarm is lit in response to particular temperature situations in the apparatus GS1, but not in response to a determined abnormality in a temperature sensor itself.

Further, while Kobayashi determines an abnormality in the pressure in a control valve 25 (paragraph [0085]), Kobayashi fails to disclose or suggest determining an abnormality in the sensor itself.

Regarding feature (1) above, Kobayashi fails to disclose implementing a temperature-maintenance operation as claimed because Kobayashi's warming up procedure is part of the start mode for operation of the fuel cell 1 (Fig. 4), which is part of the operation of the fuel cell 1, and further because Kobayashi does not disclose a temperature-maintenance mode. In the Response to Arguments section (§6), the Office Action alleges that either Kobayashi's warming up of the fuel cell 1 or Kobayashi's normal mode can be interpreted as a temperature-maintenance operation because "temperature-maintenance operation" is not defined. This is not correct. The Patent Office is required to interpret the claims in light of the specification (MPEP §2111). The specification defines the characteristics of the temperature-maintenance operation as an operation to prevent a drop in temperature in the fuel cell stack 20 (paragraphs [0029]-[0031]). The Office Action further alleges that Kobayashi's warming up of the fuel cell 1 corresponds to the claimed temperature-maintenance operation because the warm-up mode occurs while the fuel cell system is not working. This is technically incorrect because the warming up of the fuel cell 1 is an initial aspect of the normal operation of the fuel cell 1. One of ordinary skill would have understood that a warming up mode as an integral part of the normal use of a fuel cell is a different operation than a temperature-maintenance operation that is performed independent of the normal operation of the fuel cell as disclosed. Still further, the Office Action appears to allege that the recitation of a temperature-maintenance operation is an intended use for the fuel cell system and thus does not need to be given patentable weight. This is not correct.

The recited temperature-maintenance operation is recited to define the structural parameters of the claimed temperature-maintenance controller, and thus must be afforded full patentable weight.

Kobayashi further fails to disclose feature (1) above because Kobayashi fails to disclose a temperature-maintenance operation controller that, if said detected fuel cell operating temperature equals or is less than a first reference temperature while said fuel cell system is not operating, executes temperature-maintenance operation of said fuel cell using heat generated through electrochemical reaction. Instead, Kobayashi discloses that the temperature of fuel cell 1 is modified by the use of air supplied and removed by air-supplying apparatus 2 (Fig. 1).

Kobayashi fails to disclose feature (2) above because Kobayashi fails to disclose or suggest detection or determination of an abnormality in a temperature detector.

On one hand, the Office Action alleges that if the alarm becomes lit, the "driver" would know that the alarm was lit in response to an abnormality that could be either in the fuel cell or the temperature sensor itself and thus, the "driver" would somehow be able to determine the source of the alarm including if it is in the temperature sensor. Applicants understand this rejection rationale to be made under 35 U.S.C. §102(b), and not 35 U.S.C. §103(a), which the Office Action addresses later. Kobayashi does not disclose, and does not suggest, any detection of an abnormality in a temperature detector. Because an abnormality detector that detects abnormalities in a temperature detector is not needed for Kobayashi's apparatus GS1 to function, it is not inherent in Kobayashi, and the rejection under 35 U.S.C. §102(b) is improper.

On the other hand, the Office Action alleges that if the alarm becomes lit, the "driver" would know that the alarm was lit in response to an abnormality that could be either in the fuel cell or the temperature sensor itself and it would have been obvious to provide the

apparatus GS1 with the functionality to further detect whether the alarm was the result of an abnormality in a temperature detector. Applicants disagree. One of ordinary skill in the art would have known that many sensors are used in all kinds of equipment and are depended on for determinations of alarm, emergency, or attention-requiring conditions, without the sensors themselves having abnormality detectors. Sensors relied upon for determination of alarm, emergency, or attention-requiring conditions include, for example, oil pressure sensors, engine temperature sensors, and other vehicle related sensors. Thus, the Office Action's allegation that it would have been obvious to modify Kobayashi to include a detector to detect abnormalities in the temperature sensors themselves is based on impermissible hindsight and based on Applicants' disclosure.

Vander Woude is directed to a cryogenic temperature control apparatus and method and is cited for disclosing the detection of failed temperature sensors. Vander Woude discloses that if either the return air temperature sensor 45 or the evaporator coil outlet temperature sensor 46 output values outside a predetermined range, the controller 34 disregards the output of that sensor (paragraph [0044]).

Vander Woude fails to cure the deficiencies of Kobayashi because Vander Woude is not combinable with Kobayashi. Vander Woude is non-analogous art. To be non-analogous art, a reference must (1) not be in the field of endeavor as the claimed subject matter, and (2) the reference must not be directed to the particular problem with which the inventor was involved. Regarding prong (1), Vander Woude is directed to a cryogenic control apparatus designed to maintain cryogenic temperatures. In contrast, the claims are directed to fuel cell system that implements temperature-maintenance operations to prevent a fuel cell temperature from falling below a predetermined threshold. Thus, Vander Woude is not from the same field of endeavor to the claimed subject matter. Regarding prong (2), the particular problem that the claimed subject matter is directed towards is the prevention of fuel cell

freezing. Because Vander Woude's apparatus is directed to maintaining cryogenic temperatures, Vander Woude's disclosure is not pertinent to the problem of maintaining a sufficiently warm temperature in a fuel cell system, as claimed.

For the foregoing reasons, Applicants request withdrawal of the rejections.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:

Request for Continued Examination (RCE)
Petition for Extension of Time

Date: December 21, 2007

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